Message

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Sent: 11/26/2018 7:43:37 PM
To: Seth Lyman [seth.lyman@usu.edu]; minnieg@utetribe.com; Whitney Oswald [woswald@utah.gov]; Sheila Vance [svance@utah.gov]; Dave McNeill [dmcneill@utah.gov]; Kerry Schwartz [kschwartz@blm.gov]; Kenczka, Gerald E [jkenczka@blm.gov]; Gregory, Kate [Gregory.Kate@epa.gov]; gtorres@blm.gov; Lexie Wilson [lexiewilson@utah.gov]; Marc Mansfield [marc.mansfield@usu.edu]; evernon@blm.gov; Trang Tran [trang.tran@usu.edu]; miken@utetribe.com
Subject: RE: Revised IR survey final report - Beeler
Attachments: IRSurveyReport_Nov2018.docx

Seth & Team –

Thanks for final review opportunity and for providing the changes made per operator suggestion in red. My comments below:

- Is it 'cold temperatures' that dramatically reduce detectable emission rate [aerial], or, cold apparent ground temperatures?

  P.ii – Executive Summary, 1st bullet –
  Cold temperatures dramatically reduce the detectable emission rate of infrared optical gas imaging cameras when used from an aerial platform. The aerial portion of this study detected less than 1/10th the number of emission plumes that were observed in a similar study performed during summer months and had a detection limit that was between 2.5 and 7 times worse.

  … and …

  P.26 - For the aerial survey, *the background behind the plume was always the ground*, so the detection limit was determined by the contrast between the apparent plume temperature (a measure of the amount of infrared energy emitted by and reflected from the plume in the camera's bandwidth of 3.2 to 3.4 μm) and the apparent ground temperature.

  … and …

  Figure 3-14 – apparent ground temp relationship.
- P.22 – presumably the $10 included demobilization as well? "(the aerial survey also included about $10,000 in mob/demob costs that are not included in Table 3-9)" …

- P.22 - Reported Repairs
  Companies reported that they made repairs in response to this study at 56 well pads (43% of all pads with observed emissions). At 34% of the pads for which we received responses, companies indicated that observed emissions from tanks were part of normal operations (i.e., the tanks were uncontrolled), and thus repairs were not needed. We did not evaluate IR video to ascertain whether the emissions from uncontrolled tanks were due to abnormal process operations (e.g. a malfunctioning dump valve) or routine working/standing/breathing and flash emissions. Repairs were completed within 43 ± 9 days of …

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Subject: Revised IR survey final report

All: Attached is the revised report. Please let me know if you suggest further changes. Text I've changed on this round is red in the document. A couple of notes:

- I said before that the per-well cost for the helicopter is similar to the per-well cost for the ground survey we did. This is true if you use our (USU's) actual direct costs (helicopter is $22 per well, compared to about $25 per well for our direct costs). Instead of our costs, I calculated the ground survey costs using labor costs from a new paper that just came out that tried to do something similar. I used their estimated industry costs for labor, rather than our own costs, since their costs were based on an analysis of costs to industry. I also added realistic maintenance and depreciation costs for the camera (our actual cost for the camera was $0). Using this method, the per-well cost of the ground survey came out to be $50. This is explained in the Methods, and the results are on Page 22.
- Also, I took the bullet point about costs of repairs out of the executive summary. It is still in the conclusions. I wanted to keep the executive summary to a single page, and to do that I had to remove something.
- One of the suggestions was to look at pad age and production independently, to remove the effects of autocorrelation. I dug into this a bit with multiple regression, but the correlations are too low to draw any useful conclusions, so I didn't make any changes there.

-Seth

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